

16)

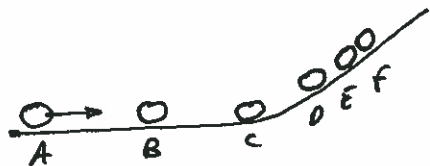
a) ruler, stopwatch

motion detector for  $v_o, v_f$ b)  $\frac{d_s}{t}$  at top verticle $\frac{d_b}{t}$  at bottom verticle $\Delta t$  for entire drop

$$c) a = \frac{\Delta v}{\Delta t} = \frac{\frac{d_b}{t} - \frac{d_s}{t}}{\Delta t}$$

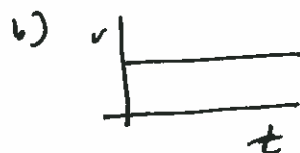
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17)

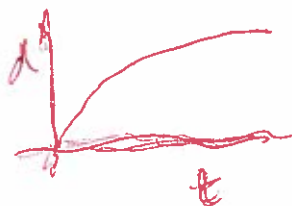


a) strobe photo ABC only

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c) strobe photo CDEF



18)

$$v_f^2 = 2ad \text{ AND } d = v_r t$$

$$d = v_r t + \frac{v^2}{2a}$$

speed of car  
road surface  
reaction time

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19) a)  $GZ = vt_y - w$

$$= (25 \frac{m}{s})(1.2s) - 12m$$

$$= 18m - 12m = 6m$$

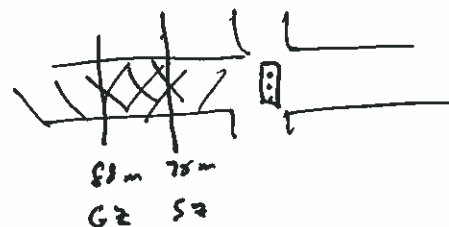
$$b) S = vt_r + \frac{v^2}{2a}$$

$$= (25 \frac{m}{s})(1.2s) + \frac{(25 \frac{m}{s})^2}{2(-7 \frac{m}{s^2})}$$

$$= 30m + 45m = 75m$$

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b)



SAFE

20)

a)



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b)



c) ~~the~~ Passenger moves in a straight line as car turns.

21)

$$a = \frac{\Delta v}{\Delta t} = \frac{75 \frac{m}{s} - 50 \frac{m}{s}}{6.4 s} = 3.9 \frac{m}{s^2}$$

$$\Delta t = \frac{d}{v} = \frac{400 m}{62.5 \frac{m}{s}} = 6.4 s$$

$$v_f^2 = 2ad$$

$$a = \frac{v_f^2 - v_i^2}{2d} = \frac{(75 \frac{m}{s})^2 - (50 \frac{m}{s})^2}{(2)(400 m)} = 3.9 \frac{m}{s^2}$$

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22)

$$m = 1200 \text{ kg}$$

$$R = 200 \text{ m}$$

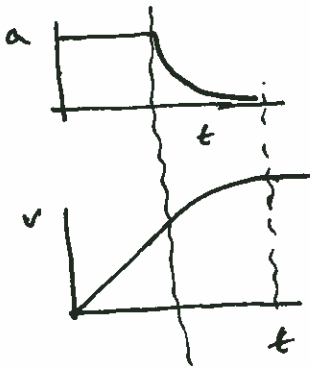
$$F_f = 2400 \text{ N}$$

$$F = \frac{mv^2}{R}$$

$$v = \sqrt{\frac{FR}{m}} = \sqrt{\frac{(2400 \text{ N})(200 \text{ m})}{(1200 \text{ kg})}} = 20 \frac{m}{s}$$

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23)



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